REMARKS

Applicant respectfully requests the Examiner's reconsideration of the present application. Applicant respectfully submit that this Amendment is responsive to the Final Rejection mailed January 14, 2005.

Summary of Office Action

Claims 1-20 are pending.

Claims 1-3, 5-7, 9-10, 12, 15-16, and 18 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,274,702 of Rosch, et al. ("Rosch") in view of Millman, et al., *Integrated Electronics: Analog and Digital Circuits and Systems*, "The CB Configuration", 1972, p. 254 ("Millman").

Claims 4, 8, 11, and 17 were rejected under 35 U.S.C. § 103 as being unpatentable over Rosch in view of Millman and further in view of Spanos, "University of California at Berkeley EE 105: Microelectronic Devices and Circuits" (Fall 1999).

Claims 13, 14, 19, and 20 were indicated as being allowable if re-written.

Response to Final Rejection

Applicant notes that the Office Action mailed January 14, 2005 was the first Office Action mailed in response to a Request for Continued Examination (RCE). The RCE was accompanied by an Amendment amending the claims and presenting arguments supporting applicant's position and responsive to the Examiner's previous Final Rejection. Accordingly, applicant respectfully submits that the Office Action dated January 14, 2005 was improperly made final and that the final rejection should be withdrawn.

Response to Examiner's response to arguments

The Examiner has based the rejections at least in part on observations discussed in a response at page 11 of the Final Office Action dated 01/14/2005. With respect to Rosch, the Examiner has stated:

> In particular, if one implemented the output buffers (132) and (134) with a common base transistor arrangement and inherent isolation would exist between all voltages on the subscriber line itself and the audio source due to transistor bias.

(01/14/2005 Final Office Action, p. 11)

Applicant respectfully submits that 1) this is clearly a hindsight argument based on applicant's disclosure; 2) the Examiner's characterization of such a modification to Rosch is incorrect; and 3) such a modification would render Rosch unworkable.

Since Rosch's amplifiers are d.c. unity gain amplifiers, the tip and ring voltages at the output of the d.c. amplifiers 132, 134 are the same as those appearing on the inputs of amplifiers 132, 134. As noted by Rosch, "the d.c. voltage levels at their non-inverting inputs determine the d.c. voltage levels at their outputs and on the wires 36, and hence on the tip and ring wires T and R of the telephone line." (Rosch, col. 11, lines 33-39). Thus there cannot be isolation from the subscriber line d.c. voltage levels.

Applicant agrees that the Rosch's buffers also do not provide isolation from the d.c. current feed (142, 144, 148, and 150). In fact, Rosch's buffers do not provide any d.c. isolation whatsoever.

Applicant submits that the elements of Rosch that provides d.c. isolation between the subscriber line and the source of the audio signal (Rx feeding 104 to 128, 130) are in fact capacitors 136, 138. Given that Rosch's amplifiers 132, 134 are simply unity gain amplifiers providing the same voltage at the output as appears at their non-inverting inputs, the non-inverting inputs must be protected from any d.c. offset contributed by the audio signal. Rosch achieves this protection by capacitors 136, 138.

Response to 35 U.S.C. § 103 Rejections

Claims 1-20 were rejected under 35 U.S.C. § 103 as being unpatentable over various combinations of Rosch, Millman, and Spanos. Applicant respectfully submits the claims are patentable under 35 U.S.C. § 103 in view of the cited references.

In order to sustain a rejection under 35 U.S.C. § 103, three criteria must be met:

> *First*, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *Second*, there must be a reasonable expectation of success. *Finally*, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure

(*In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991)(*emphasis added*)

Applicant submits that 1) the references do not teach or suggest the modification proposed by the Examiner; 2) there is no expectation of success; and 3) the combination does not teach all claim limitations.

Characterization of references

Rosch was cited for disclosing a telephone line interface circuit that receives an outgoing audio signal from the central office on a receive line which is coupled to the subscriber line through amplifier circuits. Rosch includes a disclosure of a subscriber line interface circuit having a sense network (Rosch, Fig. 2) and a line drive circuit (Rosch, Fig. 3). The line drive circuit is coupled to the tip and ring wires of the telephone line via the sensing network. The sensing network senses the tip and ring lines to determine the subscriber line differential current (ID), loop current (IL), common mode voltage (VCM), and common mode current (ICM). A digital control circuit within the linefeed driver monitors the sensed IL, ICM, and VCM and adapts the line interface circuitry. (Rosch, col. 11, lines 7-16).

Millman was cited as teaching the use of common base transistor configurations to match a low impedance source to a high impedance load.

Spanos was cited as teaching the similarity between common base amplifiers and common gate amplifiers.

Lack of motivation to combine/modify

The Examiner previously combined Millman and Rosch to arrive at the conclusion "it would have been obvious...to use a plurality of transistors,

coupled in the common-base configuration, for the line driving amplifiers to match a low impedance source with an audio signal superimposed on top to a high impedance load as taught by Millman". (01/12/2004 Office Action, p. 3)

Applicant traverses the Examiner's conclusion. There is no teaching or suggestion within Millman or Rosch to combine them in the manner suggested by the Examiner. Applicant respectfully submits that there is no teaching or suggestion to combine Millman with Rosch. Millman, for example, has presented no indication as to what would qualify as a "high impedance load" or a "very low impedance source".

The subscriber equipment has an impedance that varies significantly depending upon whether it is on-hook or off-hook. Nonetheless, applicant is unable to find any basis for the Examiner's assumption that the SLIC is a "very low impedance source". Indeed, Rosch provides values on the order of 320KΩ for resistors 140, 146 coupled to the non-inverting inputs of their respective unity gain amplifiers (Rosch, col. 11, lines 17-23; Fig. 3). Moreover, current sources 142, 144, 148, and 150 are high impedance sources. (Rosch, col. 12, lines 8-11). Similarly, there is no suggestion within either reference that the subscriber equipment is a "high impedance load" for purposes of even applying Millman. In short, there is no indication that the linefeed driver as a whole has a "low impedance source" driving a "high impedance load" which was the sole motivation (i.e., other than hindsight) for introducing Millman.

Even if workable, applicant further submits that the "modification" proposed by the Examiner would not presumably create any new advantages for Rosch thus begging the question as to the incentive or motivation for modifying Rosch.

No reasonable expectation of success

The Examiner has stated:

> The circuit of figure 3 (Rosch) depicts amplifiers 132 and 134 connected to low impedance sources superimposed with the receive path signal (i.e., audio signal) driving the tip and ring lines (i.e., high impedance load/subscriber line) respectively. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a plurality of transistors, coupled in the common-base configuration, for the line

driving amplifiers to match a low impedance source with an audio signal superimposed on top to a high impedance load as taught by Millman.

(01/14/2005 Final Office Action, pgs. 2-3)

Rosch does not address whether the source is low impedance or whether the subscriber line is high impedance. Indeed the Examiner has stated a qualification for typical applications for a common-base configuration without showing that Rosch's subscriber line and SLIC meet such a qualification.

Rosch's audio signal is one of the signals provided to Rosch's amplifier 132, 134 inputs. Rosch's audio source is a voltage signal that is applied unity gain voltage amplifiers 132, 134 for driving onto the subscriber line. Rosch's *amplifiers*, however, cannot provide d.c. isolation for its audio source because Rosch requires d.c. amplifiers of unity gain (132, 134) for the tip and ring signals. The inputs to amplifiers 132, 134 *are* the tip and ring voltage signals. (Rosch, col. 11, lines 33-39). Applicant finds no support for the Examiner's assertion that Rosch's d.c. amplifiers of unity gain provide d.c. isolation from the subscriber line.

Failure to teach or disclose claimed elements

If, as the Examiner has suggested, Rosch's amplifiers 132, 134 included a common base stage, such a stage could not be used to provide any form of d.c. isolation from the subscriber line without rendering Rosch's circuitry inoperable.

The amplifiers 132, 134 of Rosch's line drive circuit are used to drive the subscriber line. Amplifiers 132, 134 are unity gain, d.c. amplifiers. (Rosch, col. 10, lines 18-29) Thus any d.c. being driven on the subscriber line *must appear* at the non-inverting inputs of amplifiers 132, 134 (Rosch, col. 11, lines 33-39). Clearly, there is no d.c. isolation provided by amplifiers 132, 134 even if amplifiers 132, 134 contained a common base stage as proposed by the Examiner.

Rosch's audio signal (RX) is a.c. coupled to the non-inverting input of amplifier(s) 132, 134. The d.c. isolation is not provided by the amplifiers 132, 134. To the contrary, d.c. isolation for the source of the audio signal from the subscriber line is provided by capacitors 136, 138. (e.g., 104, 106, see Rosch, col. 10, lines 4-9; Fig. 3). Thus the cited references alone or combined do not teach or suggest *coupling an audio signal to a subscriber line through a plurality of transistors*

coupled in a common base configuration wherein the common base configuration provides d.c. isolation from the subscriber line for a source of the audio signal.

In contrast, claims 1, 5, 9, and 15 include the language:

1. A method comprising the steps of:
   a) receiving an outgoing audio signal; and
   b) coupling the audio signal to a subscriber line through a plurality of transistors coupled in a common base configuration, *wherein the common base configuration provides d.c. isolation from the subscriber line for a source of the audio signal.*

(Claim 1)(*emphasis added*)

5. A method comprising the steps of:
   a) receiving linefeed driver control signals and outgoing audio signals on a same plurality of signal lines; and
   b) *providing the outgoing audio signals to a subscriber line through a common base isolation stage, wherein the common base isolation stage provides d.c. isolation for a source of the audio signals.*

(Claim 5)(*emphasis added*)

9. A subscriber line interface circuit apparatus, comprising:
   a first circuit for coupling a received outgoing audio signal to a subscriber line, *wherein the first circuit couples the received outgoing audio signal to the subscriber line through a common base isolation stage, wherein the common base isolation stage provides d.c. isolation from the subscriber line for a source of the audio signal.*

(Claim 9)(*emphasis added*)

15. A subscriber line interface circuit apparatus, comprising:
   a signal processor providing an outgoing audio signal; and
   a linefeed driver coupled to receive the outgoing audio signal, wherein the linefeed driver couples the received outgoing audio signal to a subscriber line through a common base isolation stage, wherein the common base isolation stage provides d.c. isolation from the subscriber line for the signal processor.

(Claim 15)(*emphasis added*)

Thus applicant submits claims 1, 5, 9, and 15 are patentable over the cited references. Given that claims 2-4 depend from claim 1; claims 6-8 depend from claim 6; claims 10-14 depend from claim 9; and claims 16-20 depend from claim 15; applicant submits claims 2-4, 6-8, 10-14, and 16-20 are likewise patentable over the cited references.

Applicant respectfully submits the rejections under 35 U.S.C. § 103 have been overcome.

Conclusion

In view of the arguments presented above, applicant respectfully submits the applicable rejections have been overcome. Therefore all of claims 1-20 should be found to be in condition for allowance.

If there are any issues that can be resolved by telephone conference, the Examiner is respectfully requested to contact the undersigned at **(512) 858-9910**.

Respectfully submitted,

Date March 14, 2005

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